



UNITED STATES DEPARTMENT OF COMMERCE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/876,443 06/07/01 RAUCH

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026542
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MMC2/0815

EXAMINER

KIKNADZE, I

ART UNIT

PAPER NUMBER

2882

DATE MAILED: 08/15/01

Please find below and/or attached an Office communication concerning this application r proceeding.

Commissioner of Patents and Trad marks

Office Action Summary

Application No.

09/876,443

Applicant(s)

RAUCH ET AL.

Examiner

Irakli Kiknadze

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 June 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 11-14, 19, 20-25 and 27-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Uzawa et al. (US Patent 5,524,131).

With respect to claims 11-14 and 19 Uzawa discloses a method of exposing (see abstract) a resist on a substrate comprising (Fig.2) steps of:

providing the substrate (201) with a film of resist (202);

placing the substrate (201) on a stage (203); and

sensing the position of the substrate (201) with a displacement sensor (1820)

(Fig. 18; column 20, lines 6-8).

The substrate comprises a wafer. The wafer comprises a semiconductor.

The method further comprises the step of exposing the resist with radiation and further comprising the step of providing a mask for defining of the exposure resist (column 1, lines 38-52).

With respect to claim 27, Uzawa discloses (Fig. 1) a system for exposing a substrate (3) (Fig.3) comprising a stepper and X-ray source (4) (column 26, lines 1- 5) with vibration suppressing system (see Fig 85).

With respect to claim 28, Uzawa discloses (Fig. 1) a system for exposing a substrate (3) (Fig.3) comprising a stepper and X-ray source (4) (column 26, lines 1- 5) with a beam transport chamber field with helium (Fig.33, column 4, lines 45-50).

With respect to claims 20 -25, Uzawa discloses mask-wafer alignment and the displacement sensor to control the mask-wafer misalignment (column 19, lines 3-67 and column 20, lines 1-8).

With respect to claims 29-32 Uzawa discloses (Fig. 3a) a method of exposing (see abstract) a resist on a substrate (3) comprising steps of:

- providing the substrate (3) with a film of resist;
- placing the substrate on a stage;
- providing a mask (2) comprising a pattern (column 1, lines 61-67); and
- imaging the pattern on said resist at a precise moment when mask and substrate are in optimum position with respect to each other, wherein optimum position comprises one form the group, gap, x, y, z, rotation, and magnification (column 6, lines 58-68).

The substrate comprises a wafer. The wafer comprises a semiconductor.

The method further comprises the step of exposing the resist with radiation.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 15-18 and 33-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uzawa et al. (US Patent 5,524,131) in view of Huduma et al. (US Patent 6,188,513 B1).

With respect to claims 15-18 and 33-36, Uzawa shows generally all that is claimed except for the radiation having a wavelength to provide a structure having a dimension less than 100nm. Huduma discloses a radiation source for lithographic technology, having wavelengths in the 4 to 30 nm range, (producing soft X-rays or so called extreme ultraviolet (EUV)) to produce sub-100nm features (column 1, line 23-28). The X-ray radiation is collimated and concentrated (see Fig.1-5).

One skilled in art would have been motivated to use Huduma's nanolithography teaching in Uzawa's invention because it allows lithography system having a low angles of incident and low distortion such that structure having a dimension less than 100nm may be produced. This is in fact is the same general problem the applicant has set forth in the specification.

Allowable Subject Matter

5. Claim 26 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter: With respect to claim 26 prior art fails to disclose or make obvious

method of exposing a resist on a substrate wherein the displacement sensor comprises a differential variable reluctance transducer (DVRT).

Conclusion


7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Arms et al. (US Patent 5,497,147) disclose differential variable reluctance transducer.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Irakli Kiknadze whose telephone number is (703) 305-6464. The examiner can normally be reached on M-F(8:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Irakli Kiknadze
August 10, 2001


ROBERT H. KIM
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800